What is claimed is:

1. A display based on a photoluminescence quenching device (PQD), the display comprising:

a substrate;

an emitter layer;

a first electrode layer, which is transparent and is arranged on a front side of the emitter layer;

a second electrode layer, which is disposed on the backside of the emitter layer; and

at least one of a hole barrier layer or an electron barrier layer where the hole barrier layer and/or the electron barrier layer are disposed between the emitter layer and one of the first electrode layer and second electrode layer, wherein a highest occupied molecule orbital of the hole barrier layer is energetically lower than a highest occupied molecule orbital of the emitter layer and/or a lowest unoccupied molecule orbital of the electron barrier layer is energetically higher than a lowest unoccupied molecule orbital of the emitter layer.

2. The display of claim 1, wherein the lowest unoccupied molecule orbital of the emitter layer corresponds to the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer corresponds to the highest occupied molecule orbital of the emitter layer , whereby the first electrode layer forms a cathode and the second electrode layer forms an anode during re-emissive operation of the display, and the first electrode layer forms the anode and the second electrode layer forms a cathode during emissive operation of the display.

3. The display of claim 2, wherein an energy difference between the highest occupied molecule orbital of the electron barrier layer and the lowest unoccupied molecule orbital of the electron barrier layer and an energy difference between the highest occupied molecule orbital of the hole barrier layer and the lowest unoccupied molecule orbital of the hole barrier layer each amount to at least about 3.3eV.

4. The display of claim 2, wherein the electron barrier layer comprises at least one compound selected from a group consisting of triphenylamine derivatives, benzidine derivatives, and phenylenediamine derivatives.

5. The display of claim 2, wherein the hole barrier layer comprises at least one compound selected from a group consisting of oxadiazole derivatives, oxazole derivatives, triazole derivatives and quinoxaline derivatives and/or at least one compound selected from a group consisting of naphthalene carboxylic acid imide derivatives, naphthalene dicarboxylic acid dimide derivatives and wide-bandgap inorganic semiconductors.

6. The display of claim 5, wherein the wide-bandgap organic semiconductor is at least one of tin oxide, titanium oxide, zinc oxide, zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide.

7. The display of claim 1, wherein the lowest unoccupied molecule orbital of the emitter layer is energetically higher than the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer is

energetically higher than the highest occupied molecule orbital of the emitter layer, whereby the first electrode layer forms a cathode and the second electrode layer forms an anode during re-emissive operation of the display.

8. The display of claim 1, wherein an energy difference between the highest occupied molecule orbital of the electron barrier layer and the lowest unoccupied molecule orbital of the electron barrier layer and an energy difference between the highest occupied molecule orbital of the hole barrier layer and the lowest unoccupied molecule orbital of the hole barrier layer each amount to at least about 3.3eV.

9. The display of claim 1, wherein the electron barrier layer comprises at least one compound selected from a group consisting of triphenylamine derivatives, benzidine derivatives, and phenylenediamine derivatives.

10. The display of claim 1, wherein the hole barrier layer comprises at least one compound selected from a group consisting of oxadiazole derivatives, oxazole derivatives, triazole derivatives and quinoxaline derivatives and/or at least one compound selected from a group consisting of naphthalene carboxylic acid imide derivatives, naphthalene dicarboxylic acid diimide derivatives and wide-bandgap inorganic semiconductors.

11. The display of claim 6, wherein the wide-bandgap organic semiconductor is at least one of tin oxide, titanium oxide, zinc oxide, zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide.

12. The display of claim 1, wherein the hole barrier layer is disposed on a side of the emitter layer that faces towards the substrate and the electron barrier layer is disposed on a side of the emitter layer that faces away from the substrate.

13. A photoluminescence quenching device (PQD), comprising an organic light emitting material;

a first electrode which is transparent and is located on a front side of the organic light emitting material; and

a second electrode which is located on a back side of the organic light emitting material wherein the PQD comprises at least one of a hole barrier layer or an electron barrier layer disposed between the light emitting material and one of the first electrode or the second electrode and a highest occupied molecule orbital of the hole barrier layer is energetically lower than the highest occupied molecule orbital of the light emitting material and/or a lowest unoccupied molecule orbital of the electron barrier layer is energetically higher than a lowest unoccupied molecule orbital of the light emitting material.

14. The PQD of claim 13, wherein the lowest unoccupied molecule orbital of the light emitting material corresponds to the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer corresponds to the highest occupied molecule orbital of the light emitting material, whereby the first electrode forms a cathode and the second electrode forms an anode during re-emissive operation of the PQD and the first electrode forms the anode and the second electrode forms the cathode during emissive operation of the PQD.

15. The PQD of claim 13, wherein the lowest unoccupied molecule orbital of the light emitting material is energetically higher than the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer is energetically higher than the highest occupied molecule orbital of the light emitting material, whereby the first electrode forms a cathode and the second electrode forms an anode during re-emissive operation of the PQD.

16. The PQD of claim 13, wherein an energy difference between the highest occupied molecule orbital of the electron barrier layer and the lowest unoccupied molecule orbital of the electron barrier layer and an energy difference between the highest occupied molecule orbital of the hole barrier layer and the lowest unoccupied molecule orbital of the hole barrier layer each amounts to at least about 3.3eV.

17. The PQD of claim 13, wherein the electron barrier layer comprises at least one compound selected from a group consisting of triphenylamine derivatives, benzidine derivatives and phenylenediamine derivatives.

18. The PQD of claim 13, wherein the hole barrier layer comprises at least one compound selected from a group consisting of oxadiazole derivatives, oxazole derivatives, triazole derivatives and quinoxaline derivatives and/or at least one compound selected from a group consisting of naphthalene carboxylic acid imide derivatives, naphthalene dicarboxylic acid diimide derivatives and wide-bandgap inorganic semiconductors.

19. The PQD of claim 18, wherein the wide-bandgap organic semiconductor is at least one of tin oxide, titanium oxide, zinc oxide, zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide.

20. The PQD of claim 14, wherein an energy difference between the highest occupied molecule orbital of the electron barrier layer and the lowest unoccupied molecule orbital of the electron barrier layer and an energy difference between the highest occupied molecule orbital of the hole barrier layer and the lowest unoccupied molecule orbital of the hole barrier layer each amounts to at least about 3.3eV.

21. The PQD of claim 14, wherein the electron barrier layer comprises at least one compound selected from a group consisting of triphenylamine derivatives, benzidine derivatives and phenylenediamine derivatives.

22. The PQD of claim 14, wherein the hole barrier layer comprises at least one compound selected from a group consisting of oxadiazole derivatives, oxazole derivatives, triazole derivatives and quinoxaline derivatives and/or at least one compound selected from a group consisting of naphthalene carboxylic acid imide derivatives, naphthalene dicarboxylic acid diimide derivatives, tin oxide, titanium oxide, zinc oxide zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide.

23. The PQD of claim 22, wherein the wide-bandgap organic semiconductor is at least one of tin oxide, titanium oxide, zinc oxide, zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide.

24. A method for converting signal voltages into optical picture information, the method comprising:

utilizing a display using photoluminescence quenching devices (PQD), which can be operated in a re-emissive mode to suppress a photoluminescent emission, wherein freely mobile electrons at a cathode are prevented from moving in a direction of an anode by an electron barrier layer and/or electron deficient regions at the anode are prevented from moving in a direction of the cathode by a hole barrier layer.